



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/627,330	07/25/2003	Tao T. Tao	T0457.70019US00	2277

7590 03/06/2008
Timothy J. Oyer, Ph.D.
Wolf, Greenfield & Sacks, P.C.
600 Atlantic Avenue
Boston, MA 02210

EXAMINER

MARTIN, ANGELA J

ART UNIT	PAPER NUMBER
----------	--------------

1795

MAIL DATE	DELIVERY MODE
-----------	---------------

03/06/2008

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/627,330	Applicant(s) TAO ET AL.	
	Examiner Angela J. Martin	Art Unit 1795	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 12 December 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 52, 116-121 and 123-145 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 52, 116-121 and 123-145 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 7/25/03 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

This Office Action is responsive to the Amendment filed on December 12, 2007. The Applicant has added new claims 128-145. However, a new rejection is presented for the following reasons of record.

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 52, 116-121, 123-128, 130-132, 137, 139-141 are rejected under 35 U.S.C. 102(b) as being anticipated by Koch, DE 4004220 (translation in Applicant's IDS).

Rejection of claims 52, 116-121, 123-128, 137 drawn to an anode; claims 130-132, 139-141 drawn to an electrochemical device.

Koch teaches an anode, which is chemically rechargeable, wherein at least a portion of the anode is liquid ("molten metallic mass") at a temperature at which the anode is operated (p. 1, para. 1-2). It teaches the anode is operable at a temperature of less than about 1500, 1300, 1000 degrees C; about 300-1500, about 300-1300 degrees C (p. 5, para. 1). It teaches the anode is chemically rechargeable comprising tin metal (p. 1, para. 1-2). It teaches the anode comprises liquid (molten) tin at a temperature at which the anode is operated (p. 5, para. 1). It teaches a source of fuel exposable to the

Art Unit: 1795

anode (p. 3, para. 4). It teaches the fuel, when exposed to the anode, is in contact with the anode (p. 3, para. 4). It teaches the device is capable of producing electricity in the absence of fuel (col. 2, para. 1)

Thus, the claims are anticipated.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 52, 129, 132, 135, 136, 138, 141, 144, 145 are rejected under 35 U.S.C. 103(a) as being unpatentable over Koch, DE 4004220, in view of Teruhisa et al., GB2278010 (Applicant's IDS).

Rejection of claims 129, 132, 135, 136, 138, 141, 144, 145 drawn to an electrochemical device.

Koch teaches an electrochemical device as described above.

Koch does not teach a solid-state electrolyte; a solid-state cathode.

Teruhisa et al., teach the electrolyte is a solid-state electrolyte (p. 3, last para.). It teaches the electrolyte has a formula of ZrO_2 (p. 5, Example 1). It teaches a cathode in ionic communication with the electrolyte (p. 5, Ex. 1). It teaches the cathode is a solid-

Art Unit: 1795

state cathode (p. 5, Ex. 1). It teaches the cathode is a metal oxide (p. 5, Ex. 1). It teaches the cathode comprises a metal; platinum (p. 3, para. 7). It teaches the fuel is in contact with the anode (p. 3, last para. to p. 4, para. 1). It teaches the device is capable of producing electricity in the absence of fuel (p. 13, para. 2)

Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to insert the teachings of Teruhisa et al., into the teachings of Koch because the electrochemical device would be more efficient by chemically recharging the anode, as described in Teruhisa et al. Additionally, the cathode material described in Koch is platinum, as it is in Teruhisa et al.

5. Claims 52, 133, 134, 142, 143 are rejected under 35 U.S.C. 103(a) as being unpatentable over Koch, DE 4004220 (translation in Applicant's IDS), in view of Badwal et al., U.S. Pat. No. 5,942,349, and further view of Breault et al., U.S. Pat. No. 4,824,739.

Koch teaches an anode and device as described above.

Koch does not teach the device is self-repairing; device comprises a sealant precursor.

Badwal et al., teach the device is self-healing (col. 3, lines 42-45).

Breault et al., teach a sealant precursor.

Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to insert the teachings of Badwal et al., into the teachings of Koch

because it would be a protective advantage and advantageous to the life of the electrochemical device if it were able to repair itself. In addition, a sealant precursor is advantageous in order to have more flexibility in the placement of the seals throughout the device.

Response to Arguments

Applicant's arguments filed 12/12/07 have been fully considered but they are not persuasive. Applicant argues that, "Koch teaches the use of molten tin (Sn) as a secondary fuel. See, e.g., page 5, paragraph 1. However, it is not seen where Koch discloses or suggests a chemically rechargeable anode, i.e., an anode that is capable of being recharged by the addition of a chemical reductant. In Koch, the anode (described as a "current charge eliminator") is formed from platinum, as is discussed in paragraph 2 on page 5. The platinum electrode is separated from a liquid or "molten" mass by a small tube 4 that is made of Al₂O₃ (see Fig. 3), where the "molten mass" is the electrolyte and the secondary fuel (see also paragraph 1 on page 5)."

However, Koch teaches the use of molten tin as the "molten metallic mass, tin" (p. 1, para. 1-2). In addition, Koch teaches the cathode is formed from platinum, not the anode (p. 5, para. 3). Koch discloses that the anode is capable of being recharged by the addition of a chemical reductant (p. 3, para. 3-5).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Angela J. Martin whose telephone number is (571)272-

Art Unit: 1795

1288. The examiner can normally be reached on Monday-Friday from 10:00 am to 6:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Ryan can be reached on 571-272-1292. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

AJM
/Angela J. Martin/
Examiner, Art Unit 1795